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Appl. No. 10/791,507

Amdt. dated Friday, 18th July 2008

Reply to Office action of 22-Jan-08

REMARKS/ARGUMENT

Reconsideration Respectfully Requested of Claim Rejections

Applicants, through their assignee, have given careful consideration to the grounds of the examiner in rejecting certain claims under 35 USC §§102(e), 103(a). Claims 8 – 16 have been withdrawn from consideration herein, as drawn to unelected species, but not yet cancelled. For expediency/efficiency of prosecution, applicants solicit reconsideration of the restriction requirement as to species, and request rejoinder of any permitted species claims.

Any amendment or remark/argument made herein has been made for purposes of clarification of subject matter sought to be patented, enjoying full support of applicants' specification, claims, drawings, and abstract as filed; no new matter is included. Each independent claim recites distinguishable features, as does each claim depending therefrom: Applicants respectfully solicit reconsideration the primary examiner's rejections.

Rejection under 35 USC §102(b) using Salyer U.S. Re. N^o 34,880, herein "SALYER"

Claims 1, 2, 6 and 7 stand rejected under §102(b) as being anticipated by SALYER:

Table in col. 3 discloses composition comprising following components: Binder (EPDM)

100 pbw, paraffin wax 33-66 pbw and aggregate 50 pbw. Aggregate in example is silica,

however specification teaches use of other aggregates such as gravel, granite, limestone, quartz

(which is also SiO₂) and the like (col. 6 and 7). Mixtures of such aggregates are also enabled.

This is a misinterpretation of data in the table under EXAMPLE 3, col. 11 of SALYER, thus amounting to an incorrect extrapolation thereof to suggest SALYER contemplates use of a binder material. Throughout SALYER, *no* mention is made of use of a binder material as recited in applicants' claim 1, from which claims 2 – 7 depend. Since there is no table 3 in col. 3, nor is there any table labeled "Table 3" in SALYER, presumably what is meant (see above quote from the action) is the unidentified table in EXAMPLE 3, col. 11, copied below for discussion, here:

EXAMPLE 3

The following rubber (EPDM) compositions were prepared and cured at 350° F. for 30 minutes. The alkyl hydrocarbons employed in each of the compositions retained their melting point and heat of fusion characteristics.

	Parts by Weight					
	1	3	7	5	9	11
EPDM	100	100	100	100	100	100
Shell X-100 Paraffin Wax (Shell Oil Co.)	66	66	50	33	33	33
Silica Filler	50	—	50	50	—	—
Carbon Black Filler	—	50	—	—	50	50
Stearic Acid	5	5	5	5	5	5
DjCup R (Hercules Chemical Co., vulcanizing agent)	3	3	3	3	3	3
Octadecane	—	—	16	33	—	—
Octadecane (technical)	—	—	—	—	33	—

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EPDM rubber (ethylene propylene diene monomer rubber) is an elastomer; as a synthetic rubber, EPDM has well known uses as weather-seals on vehicles (as door, window, trunk, and hood seals), as well as in sheets used to waterproof roofs of buildings. The EPDM rubber of EXAMPLE 3 makes up the bulk of the composition of the EXAMPLE 3 material; functionally, rubber is the base medium for the SALYER polymeric/rubber-alkyl hydrocarbon composition embodiment. Listed in the table for EXAMPLE 3 is a *vulcanizing agent* of 3 'parts by Weight'. Note that EXAMPLE 2 lists "and 2.5 parts sulfur." Sulfur is a well known *vulcanizing agent* used to cure (i.e., vulcanize) soft uncured rubber (characteristically sticky and easily deformable when warm). Vulcanization is a conventional, generally-irreversible process resulting in a *cure* of the underlying rubber compound into a thermoset material, as distinguishable from thermoplastics. High heat, pressure, and the addition of sulfur (curing agent), are used to create 'atomic bridges' composed of sulfur atoms or carbon to carbon bonds, thus inter-linking the polymer molecules of (cured) rubber.

The silica added to the EPDM rubber base operates as a filler. Col. 8, lines 9 – 18 of SALYER explains the limited contemplated use of silica filler in connection with preparation of inorganic cementitious compositions such as Portland cement; the silica filler does not provide any functionality as a binder material:

It has also been found that the amount of alkyl hydro-
10 carbon incorporated into inorganic cementitious compositions such as Portland cement compositions and the like can also be increased if the alkyl hydrocarbon is used in combination with a highly absorptive filler such as a finely divided silica (e.g., CAB-O-SIL or HiSil). It
15 has been found that pre-mixing the alkyl hydrocarbon with such a highly absorptive filler, the hydrocarbon resides in the filler and detracts less from the strength of the concrete or cement composition.

Next, in further support the §102(b) anticipation rejection, the examiner states:

Rubbers or other polymeric materials are listed in col. 9 of SALYER. PCM of SALYER

is described in detail in col. 4.

Col. 9 of SALYER simply describes incorporation of "the alkyl hydrocarbon into rubber and other elastomers having significant crystallinity so that they can also function as phase change materials;" Col. 9, lines 17 – 29 focuses on the notion that dissolving or dispersion of the alkyl hydrocarbon within a polymeric material, such as natural and synthetic rubber, makes little difference. Patentably distinct from SALYER's rubber-alkyl hydrocarbon composition as well as SALYER's cementitious composition embodiment, is applicants' agglomerate tile structure, as claimed having at least 10% by mass of a binder material, along with at least 12% by mass of

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phase change material component, and a granular base medium comprising of at least 30% by mass. The SALYER rubber-alkyl hydrocarbon material does not use a granular base medium, but rather a polymeric material. The extended discussion in SALYER that relates to the use of alkyl hydrocarbon within a polymeric material, cols. 9 – 11, addresses a combination of components with a polymeric base rather than a granular base medium. It is no surprise that no binder material is suggested by SALYER: The design considerations for the SALYER rubber-based product are very different from those encountered by applicants.

While SALYER devotes a substantial portion of cols. 4–5 to discussing PCM's—and references Chen Patent N^o 4,504,402 in col. 2, stating "*Chen teaches an encapsulated phase change material which is prepared by forming a shell about a phase change composition in compacted powder form.*"—SALYER says nothing further about incorporating an *encapsulated* phase change material with its cementitious compositions or its polymeric-based compositions. Rather, SALYER only mentions that alkyl hydrocarbons can be made into pellets or granules by way of grinding or cutting the polymer (col. 8, lines 44 – 47). SALYER continues (col. 8):

... For use in cementitious compositions, the polymeric compositions need not be crosslinked since the thermal form stability of the pellet is not important. In this case the cementitious composition can include up to 50% by weight of the pellets or granule containing the hydrocarbon phase change material. To increase the amount of alkyl hydrocarbon incorporated or imbibed into the pellet and to hold it in the pellet it is often desirable to include the aforementioned absorptive silica filler in the pellet.

Teaching even further away from applicants' claimed combination, SALYER (see col. 7, line 68 – col. 8, line 23) sets forth a series of its design constraints that directly contradict those of applicants' claimed agglomerate tile structure; SALYER describes a composition very different than that claimed by applicants. In connection with the incorporation of alkyl hydrocarbons into cement or concrete compositions, SALYER states (*emphasis added*):

... It is generally *not desirable to use more than about 5% dry weight* alkyl hydrocarbon in a concrete composition. However *if the amount of aggregate in the composition is reduced or the aggregate is completely eliminated, approximately 10% alkyl hydrocarbon may be added.* On the other hand in gypsum, plaster of paris, or dry wall compositions, *between 10 and 20% by weight* of the alkyl hydrocarbon may be added in the wet mix.

... *There is no lower limit on the amount of alkyl hydrocarbon used in the composition* theoretically any amount will provide some thermal storage benefit. Typically, the compositions of the present invention contain *at least 1%* of the crystalline alkyl hydrocarbon.

These design constraints produce a composition very different from that claimed by applicants.

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A closer look at SALYER illustrates not only that recited features are missing, but emphasizes just how far the technology discussed therein deviates from the unique combination of features/structure claimed by applicants.

Claim Rejections under 35 USC § 102 / Anticipation – Legal Summary

As we know: "For a prior art reference to anticipate in terms of 35 U.S.C. §102, every element of the claimed invention must be identically shown in a single reference These elements must be arranged as in the claim under review" *In re Bond* (Fed. Cir. 1990). The Federal Circuit has reiterated that "[t]here must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of the invention, [*Scripps Clinic & Research Foundation*]" . A prior art reference anticipates a claim only if the reference discloses, either expressly or inherently, every limitation of the claim. See *Verdegaal Bros., Inc. v. Union Oil Co.* (Fed. Cir. 1987). "[A]bsence from the reference of any claimed element negates anticipation." *Kloster Speedsteel AB v. Crucible, Inc.* (Fed. Cir. 1986). An anticipation rejection under §102 can stand against a pending claim *only* if a single piece of prior art discloses a combination including *each* element of the pending claim such that each prior art element is identical to a corresponding, similar structurally-arranged and operationally substantial equivalent element of the pending claim. This is not the case, here. For reasons enumerated, applicants submit that their independent claim, as well as each dependent claim depending therefrom, includes features not disclosed by any reference cited.

Rejection under 35 USC §103(a) using Salyer U.S. Re. N° 34.880, "SALYER"
in further view of Chen U.S. Patent N° 4,513,053

Claims 1–7 stand rejected under 35 USC §103(a) as being unpatentable over SALYER in view of Chen Patent N° 4,513,053. Once again, regarding the features and focus of SALYER as mentioned above: A closer look at SALYER illustrates just how far the technology discussed therein fundamentally deviates from the unique agglomerate tile structure claimed by applicants. Furthermore, there is no need or reason identified or suggested by SALYER or Chen — nor can any practical motivation be found after a closer appreciation of each of SALYER and Chen — to combine SALYER with any other reference to arrive at applicants' unique claimed structure. Rather, as pointed out above, SALYER expressly leads one away from an agglomerate tile structure, as claimed, comprising: (a) at least 10% by mass of a binder material; (b) at least 12% by mass of a phase change material (PCM) component; and (c) at least 30% by mass of a granular base medium comprising at least one granular-sized stone.

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One, of the many, differences between applicants' claimed combination and Chen has been correctly identified on page 4 of the Office action: "difference between . . . and the teachings of SALYER is recitation of microencapsulated PCM." However, the second difference between the claimed structure as noted on page 4 of the Office action is based on a faulty interpretation of SALYER as explained above: "as well as a different way that a binder can be utilized in addition or in place of the rubbers of SALYER." The rubbers of SALYER do not function as a binder; functionally, the rubbers are used as the base medium of the SALYER rubber-alkyl hydrocarbon composition embodiment.

Next, in further support the §103(a) obviousness rejection, the examiner states:

The PCM material of CHEN is solid state PCM encapsulated by wall forming binder

such as epoxy or polyester (col. 4).

This interpretation is directly at odds with Chen's express teaching about inert 'capsule' walls:

Most inert wall-forming materials can be used in the 30
coating steps including polymer latexes, ceramic mix-
tures, and solvent-based polymer systems. The wall-
forming compositions used in the other techniques dis-
closed above have been severely limited in selection and
only gelatin, nylon, and urea types were practical candi- 35
dates. In some cases, polymer walls can be formed dur-

[col. 5, lines 30 - 36] . . .

In a preferred variation, the capsule walls are made
inert so that the capsules can be potted in building mate- 50
rials such as plastic or concrete to provide passive stor-
age without seepage or chemical interaction with the
substrate.

An important feature of the process and product is
that the composition be coated with at least one seam- 55
less layer of inert wall-forming material in an amount
ranging from about 5% to about 30% by weight of the
product. Preferably, there will be at least two layers,
but in all cases the layers are required to be seamless. Of
course, additional layers with seams can be present 60
provided that there is at least one and preferably two
seamless layers of wall forming material in the amount

[col. 5, lines 49 - 63, and elsewhere]

And finally, in connection with applying Chen, page 5 of the Office action concludes:

In the light of the above disclosure, it would have been obvious to one having ordinary

skill in the art at the time of the instant invention to encapsulate wax of Chen in order to obtain

all the advantages described in this discussion.

Thus, having the benefit of applicants disclosure at-hand, in hindsight cookbook fashion, page 5

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of the action enumerates reason(s) for microencapsulation of PCMs, done without regard for the undesirable effects of mixing different constituents, at selected temperatures, using different base medium(s), in different amounts than those taught in SALYER (in some cases contradicting design constraints identified by SALYER). Especially difficult to comprehend is the last of these enumerated reasons, page 5 of the Office action: *"Depending on the type of the PCM further advantages may include minimized or completely obviated damages associated with phase change, long term reliability, efficient phase transfer and prevention of phase separation."* While precedent from the federal courts has shifted, in certain aspects, toward providing greater flexibility in rejecting claims during examination, it is still impermissible to apply hindsight when combining references or using artisan general technical knowledge to draw conclusions.

"Section 103 forbids issuance of a patent when 'the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.'" *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1734, 82 USPQ2d 1385, 1391 (2007). The Supreme Court continued "[f]ollowing these principles may be more difficult in other cases than it is here because the claimed subject matter may involve more than the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for the improvement." *Id.* The Court explained, "[o]ften, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue." *Id.* at 1740-41, 82 USPQ2d at 1396. The Court noted that "[t]o facilitate review, this analysis should be made explicit." *Id.*, citing *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006) ("[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness").

Here, it is *not* a case of a substitution of one element—for instance, a mechanical actuator device replaced by a processor-driven device to perform the same function—as was the case set out by the Federal Circuit where it concluded, upon application of *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727 (2007) that it would have been obvious to combine (1) a mechanical device for actuating a phonograph to play back sounds associated with a letter in a word on a puzzle piece with (2) an electronic, processor-driven device capable of playing the sound associated with a

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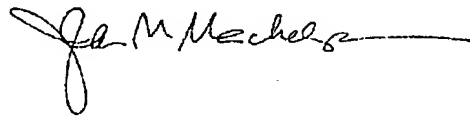
first letter of a word in a book. See *Leapfrog Ent., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1161, 82 USPQ2d 1687, 1690-91 (Fed. Cir. 2007) (“[a]ccommodating a prior art mechanical device that accomplishes [a desired] goal to modern electronics would have been reasonably obvious to one of ordinary skill in designing children’s learning devices”). But rather, the applicants hereof have designed a unique structure, having been faced with complex and unordinary design issues associated with, as explained in the spec, on-going work to upgrade tile structures for use in thermal management systems that are uniquely comprised of a component phase change material (PCM), along with a binder material, and granular base medium.

Summary/Conclusion and Request for Reconsideration

With both SALYER and Chen silent as to core claimed features, and not only can no suggestion or teaching be found to modify or to combine either reference with any other that has been identified as applicable—it would be impractical to assert so. The solution focus of each reference is different than that contemplated by the applicants. As such, applicants’ claims, as amended, are patentable and overcome the §102 and §103 rejections. Each reference stops short of appreciation to arrive at the innovation claimed in applicants’ independent claim. And, although each dependent claim depending from an independent claim containing patentable subject matter is also considered patentably distinct by way of including features of a respective patentable independent claim, applicants’ dependent claims include further unique limitations. Favorable reconsideration is respectfully solicited.

Please do not hesitate to call the undersigned: a call would be most-welcomed to address any issues the examiner deems outstanding.

Respectfully submitted 22th day July 2008



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